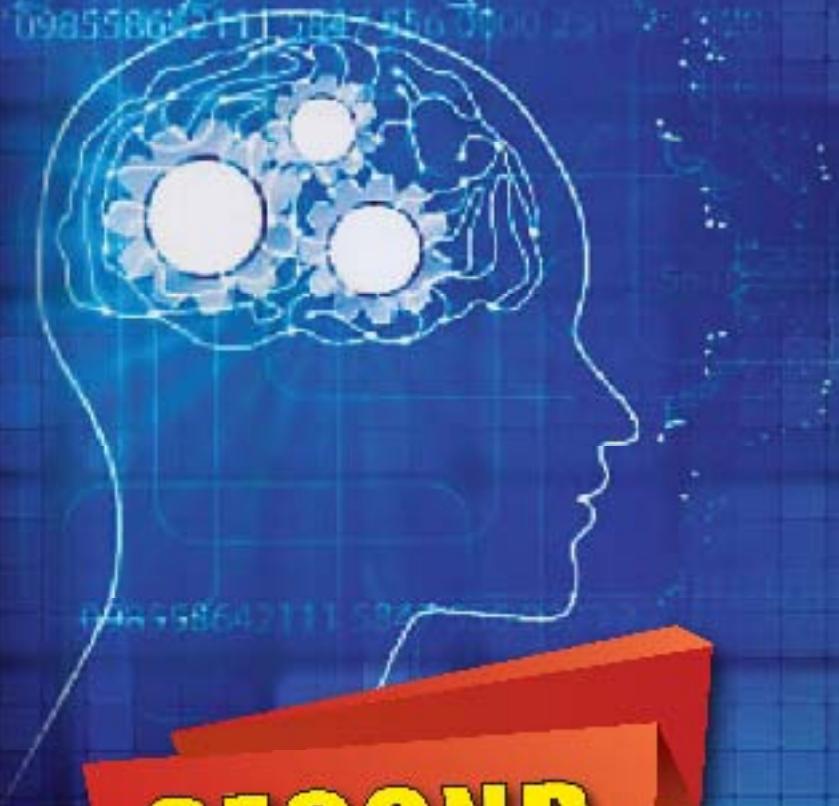
THE DOCTORAL RESEARCH ABSTRACTS

Volume: 2, Issue 2 Nov 2012



SECOND ISSUE

INSTITUTE of GRADUATE STUDIES

Leading You To Greater Heights, Degree by Degree

IPSis Biannual Publication

3

Name : **Nurharniza Bt Abdul Rahman**

Title : **Performance of Wall-Slab Connection Enhanced with Steel Fibres under Reversible Cyclic Load**

Faculty : **Civil Engineering**

Supervisor : **Prof. Ir. Dr. Siti Hawa Hamzah** (MS)

Associate Prof Dr. Nor Hayati Abdul Hamid (CS)

The most critical stress concentration build-up in a tunnel-form construction is in the wall-slab connection at the first floor level. A total of twelve (12) wall-slab samples were cast, six (6) as anchorage connection and another six (6) as cross-bracing. All samples were tested under cyclic load using displacement control; six (6) samples under lateral and the remaining six (6) under vertical. Hooked end steel fibres (**SteFib**) were added in the concrete mix and placed at various locations in the wall-slab samples. The concrete grade used was 30 N/mm2. The anchorage connection with **SteFib** placed in the connection section only (L-A-C and V-A-C) performed better in ductility, energy dissipation and crack control, when compared to cross-bracing samples (L-CB-C and V-CB-C), under both lateral and vertical cyclic load capacities. The displacement increased more than 100% in L-A-C when compared to L-CB-C. Crack propagations reduced by 50% with major cracks occurred at 200 mm above the connection. Likewise, the displacements increased by 75% and more than 100% under pushing and pulling load phases respectively, in V-A-C when compared to V-CB-C. A comparative study using Ruaumoko modelling showed experimental load in the anchorage connection with **SteFib** increased the displacement by 39% under lateral cyclic load. Further analysis using PROKON showed maximum stresses concentrated at the first floor wall-slab connection section. Therefore, it is recommended to the construction industry to adopt the anchorage wall-slab detailing with double layer steel fabric with **SteFib** placed in the connection section to provide good resistance under cyclic load.